CLAIMS

1. A method for transferring a glucosyl residue to a polyalcohol, comprising a step of:

allowing a trehalose phosphorylase to act on a saccharide containing glucose as a component sugar, and one or more polyalcohols selected from the group consisting inositol, ribitol, erythritol, and glycerol.

2. A method for transferring a glucosyl residue to glucuronic acid and/or a salt thereof, comprising a step of:

allowing a trehalose phosphorylase to act on a saccharide containing glucose as a component sugar, and glucuronic acid and/or salts thereof.

3. A method for transferring a glucosyl residue to a derivative of glucose whose C-6 hydroxyl group bound to a saccharide:

allowing a trehalose phosphorylase to act on a saccharide containing glucose as a component sugar, and one or more derivatives of glucose whose C-6 hydroxyl group bound to a saccharide, selected from the group consisting isomaltose, gentiobiose, melibiose, isomaltotriose and isopanose.

4. The method of any one of claims 1 to 3, wherein said saccharide containing glucose as a component sugar is β-D-glucose-1-phosphate and/or a salt thereof or trehalose.

5. The method of any one of claims 1 to 4, wherein said trehalose phosphorylase has a thermal stability of keeping 80% or higher phosphorolytic activity when the enzyme is treated at pH 7.0 and 60° C for one hour.

6. The method of any one of claims 1 to 5, wherein said trehalose phosphorylase is a natural enzyme originated from *Thermoanaerobium*

brockii or a recombinant enzyme thereof.

7. A process for producing a glucosyl-transferred polyalcohol or a composition comprising the same, comprising the steps of:

forming the glucosyl-transferred polyalcohol by the method of claim 1 or any one of claims 4 to 6; and

collecting the formed glucosyl-transferred polyalcohol or the composition comprising the same.

8. The process of claim 7, wherein the formed glucosyl-transferred polyalcohol or a composition comprising the same is collected by one or more methods selected from the group consisting of decoloring, deionization, filtration, concentration, chromatography, drying and crystallization.

9. A process for producing a glucosyl-transferred glucuronic acid and/or a salt thereof or a composition comprising the same, comprising the steps of:

forming the glucosyl-transferred glucuronic acid and/or a salt thereof by the method of claim 2 or any one of claims 4 to 6; and

collecting the formed glucosyl-transferred glucuronic acid and/or a salt thereof or the composition comprising the same.

10. The process of claim 9, where the formed glucosyl-transferred glucuronic acid and/or a salt thereof or a composition comprising the same is collected by one or more methods selected from the group consisting of decoloring, deionization, filtration, adsorption, ion dialysis, concentration, chromatography, drying and crystallization.

11. A process for producing a glucosyl-transferred derivative of glucose whose C-6 hydroxyl group bound to a saccharide or a composition

comprising the same, comprising the steps of:

forming the glucosyl-transferred derivative of glucose whose C-6 hydroxyl group bound to a saccharide by the method of any one of claims 3 to 6; and

collecting the formed glucosyl-transferred derivative of glucose whose C-6 hydroxyl group bound to a saccharide or the composition comprising the same.

12. The process of claim 11, wherein the formed glucosyl-transferred derivative of glucose whose C-6 hydroxyl group bound to a saccharide or a composition comprising the same is collected by one or more methods selected from the group consisting of decoloring, deionization, filtration, adsorption, ion dialysis, concentration, chromatography, drying and crystallization